II.—EULENBERG: DISEASES OF THE NERVOUS SYSTEM.

LEHRBUCH DER NERVENKRANKHEITEN, von Dr. Albert Eulenberg. Zweite umgearbeitete und erweiterte Auflage. 1. Erster (allgemeiner) Theil. Pp. 377. 2. Zweiter (specieller) Theil. Pp. 718. Berlin, 1878.

The first edition of this important work appeared in 1871 (*Lehrbuch der Functionellen Nervenkrankheiten auf physiologischer Basis bearbeitet,etc.*), in a much less complete form than at present. Then it professedly related only to the *peripheral nerves.* But now, this portion of the general subject, as treated by the author, has been rewritten, and in the main brought up to the level of existing knowledge, not alone, but the plan of the work has been enlarged so as to include the more important affections of the central nervous system. As it now appears fresh from the hands of its accomplished author, we know of no manual on nervous diseases which comes nearer our ideal of what such a work should be. As may have been already noticed, the work consists of two parts, a *general* and a *special*, the latter by far the largest. In the following notice the attention of the reader is to be called exclusively to the first part, leaving the other to be noticed perhaps in a future number of the JOURNAL.

In the *general* part we find, as might have been expected, a discussion of those general facts or principles, anatomical, physiological and pathological, which underlie the entire field of neurological medicine. The discussion has been conducted by one who seems well fitted for it, both by nature and by his acquirements, with rare good sense and practical tact. Dr. Eulenberg joins to a wide and accurate knowledge of the experimental and practical phases of his difficult theme, as well as its literature, a sound, discriminating judgment. His analysis of his subject is judicious, his thought clear, and his style simple. Such qualities have enabled him to produce an exceedingly readable and instructive book. But without farther delay we pass to a short survey of the general principles of nerve pathology, in the light in which they have been placed by our author.

Disorders of the nervous system are divided by Dr. Eulenberg into *Neuroses of sensibility*, *Neuroses of motility*, *Neuroses of nutrition* and *Psycho-neuroses*, the first three alone being treated in his work. The first volume, as already intimated, is devoted to general consideration, in which morbid phenomena are brought face to face with our existing knowledge of the anatomy and physiology of the nervous system.

Neuroses of sensibility (*Æsthesioneuroses*) are first treated of

in their more elementary or fundamental forms. In order to explain morbid it is necessary to understand healthy phenomena. Hence Dr. Eulenberg enters on a brief but rather penetrating discussion as to the intimate nervous structures and processes, which are known, or supposed, to be involved in nervous sensibility when it is roused by appropriate stimuli. He supposes, as many others have done, that the sensory impulses, which are caused in many ways to pass along the sensory nerve fibres, are conveyed into certain nerve cells in which the fibres finally terminate, and that an agitation of the particles which compose the cells occurs and in some way this gives rise within the cell to sensation, and we presume, for that matter, even to those closely allied but higher nervous and mental processes which pass under the names of perception, emotion, etc. Dr. Eulenberg adopts the gratuitous supposition so often maintained by others, that the *vividness* or strength of a sensation — that is, of a response to a sense impression — depends on the *resistance* which the cell opposes to the molecular motion which the shock of the sense impression that arrives by the way of a fibre tends to excite. He appears to adopt the law of Bernstein, which may be stated as follows: "The *quantity* of a sensation may be estimated by the number of ganglion cells required to neutralize or arrest the molecular disturbance caused by a given sense impression." If the resistance is greater in the cells, the reaction to the sense impression is sharper and sensation is more acute. If it passes into a greater number of cells, it is because the resistance in them is less, and hence the sensation experienced is less acute. Farther, the strength of a conscious sensation is determined by two factors: the intensity of action of the irritant, and the quantity or degree of resistance met with in the sensory cells. Fechner (*Psychophysik*) is quoted under this head, where on the above indicated assumptions he seeks to bring sensation under the dominion of the calculus, and as a much paraded result, announces a barren formula which utterly misses the soul of sensibility and sensation in confusing *quantitative* with *qualitative* relations. We have no hesitation in declaring for our own part, that Fechner's laws of sensation do not in anything touch the heart of the subject to which they relate, valuable as they may be, in a hypothetical way, in the exterior nervous processes involved in sensation. It is a well-meant but in the end fruitless endeavor to carry mathematical processes into a sphere where nearly every essential element in a series of equations is hypothetical, or even fanciful. What we object to in this case and all such cases is not the endeavor to penetrate as far as possible by the industrious and judicious use of such methods of study, but rather to the unwarranted and misleading confidence placed in the *results*. To suppose, as seems to be done by some, that they enable us to explain the *real nature* of sensation, betrays a primary misconception as to what sensation really involves.

We have been rather sorry to see so judicious a thinker and writer, as is Dr. Eulenberg, laying so much stress on these practically almost valueless speculations. But we must decline entering any farther into a discussion, which could prove of interest to but few of our readers, and instead pass to more accessible and useful topics.

There is considerable merit in the classification of neuroses of sensibility given by Dr. Eulenberg. Increased sensibility passes, as usual, under the general term *hyperæsthesia*, and complete loss under that of *anæsthesia*. But a mere diminution in sensibility is called *hypæsthesia*. Pain is placed among "dysæsthesias," and is described as a case in which the *subjective* element in sensation rises above its normal level of intensity. *Paræsthesias* include that group of peculiar sensations such as pruritis, formication, morbid hunger, or morbid thirst, globus, etc. In the final analysis of these examples of morbid sensation, they are to be subordinated to hyperæsthesias or to hypæsthesias, but deserve to stand in a separate class for clinical reasons.

In the special discussion of hyperæsthesias, they are divided into three classes: *peripheral*, *conducting* (intercurrent) and *central*. These forms of hyperæsthesia are described throughout as being distinct. We wish to direct the attention of the reader to this subject for a few moments.

The *nerve cells*, of the nervous centres, or certain among them, it seems probable, are the sole seats of true sensibility, at least those of its forms which are manifested in consciousness. The nerve fibres which lead to them, and in connection therewith the peripheral apparatuses of sense in which the fibres terminate outwardly, are *not* the seats of sensibility proper. They are simply for the reception and conduction of sense impressions (not *sensations* as is so often loosely said) to the central sensory cells, where they may be appreciated, or known, or lower down, functionally speaking, minister to nervous reflexes, apart from consciousness and will. A pacinian corpuscle, or a nerve fibre has no such capacity, in the sense that nerve cells may have. No fact is better known in the physiology of the nervous system. But if this be so, how comes it to pass that we may have a *peripheral*, or a *conduction* hyperæsthesia? What is hyperæsthesia? It is in a few words sensibility exalted above the normal level of acuteness. Are conduction and sensibility convertible terms? Most certainly not. And yet conduction, and not sensibility, may be said to be the proper function of nerve fibres. Even if it be granted that by disease, a nerve fibre may be so changed as to *magnify* as compared with a normal fibre, the sense impressions it transmits to the seats of sensibility, could such a condition of things be called *hyperæsthesia*? It might be called *hyperconduction*, but it could not in any sort of strictness be called by the former name. At most that could be said there would be only an *apparent* hyperæs-

thesia, the fact being that the conductibility of the fibre is in such state as to magnify the intensity of the original sense impression as it passes along toward the centre, so that an exaggerated impression may be delivered at the true seat of sensibility. This we say, would be an apparent, but not a real hyperæsthesia. But what good proof have we that any such state as this ever occurs? We have no hesitation in declaring there is none. There is no such thing in the proper sense of the words as a "peripheral" or a "conduction" hyperæsthesia, for the parts of which these things are predicated have no such function in health as sensibility in the sense now supposed, and hence cannot have it in disease. It is true that localized disease of the peripheral sense apparatuses, or of the conducting tracts may lead to hyperæsthesias, but only because the related sensory cells are secondarily disturbed in their nutrition, or, to use a common but uncertain expression, in their molecular state, in such manner as to increase their sensitiveness. But there is no reason, so far as we can see, for thinking there would have been a true hyperæsthesia, if the condition of the seat of sensibility, in other words the centre, had remained in *statu quo*. In this brief discussion we have laid aside those cases in which through anæmia, or in a general way there is lowered nutrition, and, as a consequence, abnormal acuteness of general sensibility; for in this case, there can be no reasonable doubt but that the whole nervous system is involved in the change, especially the centres.

The divisions made of hyperæsthesias by Dr. Eulenberg, is, in reality, made chiefly from a causal point of view. There can be no doubt but that disease or injury of the peripheral sense apparatuses, or nerve trunks, or conducting tracts still more centrally situated, may lead to hyperæsthesias. The sole question in our minds is as to the real seat and inner mechanism of the same. We do not deny altogether the correctness of the views of Dr. Eulenberg, but do contend that enough stress is not laid on the condition of the central apparatus, which is the sole seat of true sensibility, the opinion of Mr. G. H. Lewes and others, to the contrary notwithstanding. Happily, however, such matters have a dialectical rather than a practical interest. But we would not despise the greatest attainable accuracy of apprehension and statement of a case.

In the first place, disorders of sensibility are discussed with unusual fullness and precision. In discussing the various methods of testing the space sense of the skin, he makes no reference to the rather elaborate researches of Leudet, in the domain of æsthesiometry. The following law is formulated from the researches of various observers working under the direction of Vierordt: *Parts are more sensitive, according as they are more movable.* Extended and valuable discussions as to the methods of determining the state of the senses of pressure, temperature, pain, etc., are given, which we commend to the attention of the reader.

A discussion also of the methods employed for determining the rapidity of conduction of sensory and motor impressions along the nerves, is had, in regard to its diagnostic relations. Particular reference is made to the valuable work of Burckhardt, (*Die physiolog. Diagnostik d. Nervenkrankheiten, &c.* Von S. Burckhardt, Leipzig, 1875, p. 284.) But this subject has been already examined at considerable length in a review of Burckhardt's work in a former number of the JOURNAL (vol. II., p. 566).

Under the head of hyperæsthesia of the sense of touch (Hyperpselaphesia) Dr. Eulenberg quotes apparently with approval, the opinion of Brown-Sequard, that in cases where in applying the two points of the æsthesiometer *three* points are felt instead of two, there is disease of the base of the brain—(basal system), more particularly of the crura cerebri, and pons. But we would rather account for such a phenomenon by supposing it to be an illusion on the part of the patient than to adopt the hypothesis of Dr. Brown-Sequard, who assumes the formation of new cells, which like pre-existing cells stand in connection with pre-existing fibres, so that there are new and uncustomary sense centres added to those which naturally exist. This ingenious hypothesis is purely gratuitous, however, though not unreasonable.

In discussing the nature of cutaneous paralgias, such as pruritus, Dr. Eulenberg would seem in most instances to consider them to depend on disease of the nerve terminations in the papillary eminences of the true skin. But we must think, that in this, as in other sensory neuroses, there is a possibility that many, if not the majority of such cases, may depend on central disorder, the outward symptom being merely a projection phenomenon. But in this and similar instances, we refer the reader to our remarks above, on our author's classification of hyperæsthesias. He does not overlook or deny that such symptoms may have a central origin, but fails to lay the stress on this point which it seems to us to demand.

Formication (Ameisenkriechen), subjective feelings of heat and cold, etc., are acknowledged to have a central origin.

Cutaneous neuralgias are discussed at some length, in the course of which the more common criteria of neuralgic pain are laid down. They are said to be: 1. That the pain shall be *spontaneous*, and provoked by morbid processes within the organism itself. 2. That it shall arise with unusual suddenness and intensity and be confined to the course and sphere of distribution of particular sensory nerves. 3. That it shall not be continuous, but appear in paroxysms, with intervals of partial or complete freedom from pain. These are the common criteria of a neuralgia.

The *radiation* or apparent propagation of pain along the course of a nerve, is referred to an affection of the *nervi-nervorum*, rather than the nerve trunk itself, and also, after Bærwinkel, to a neuritis. Upon the whole Dr. Eulenberg discusses rather acutely the intimate physics of pain, but arrives at no valuable conclusions.

No special stress is laid on the "painful points" of Valleix, nor on the "points apophysiaires" of Trousseau.

In the discussion of the general pathogenesis and etiology of neuralgias, they are referred in the last analysis to "changes in the molecular mechanism of the sensible nerve masses," but it is admitted that as to the nature of these changes, we are completely in the dark. A large number of neuralgias are said to be the outcome in all probability, of a "constitutional anomaly, which appears to consist in unusually abnormal functioning of the whole nervous system, or more particularly separate parts of the same."

Dr. Eulenberg appears to admit the existence of the "constitutional neuropathy," contended for by Griesinger, which is prolific not of neuralgias alone, but of hysteria, epilepsy, various convulsive and paralytic affections, insanity, etc. He also would admit the existence of heredity in the production of neuralgia, which was so much insisted on by Anstie, and also another fact as it seems to be dwelt on by this latter author, that there is a kind of commutation, or rotation of diseases, not only in the same person, but in different persons, in the line of hereditary descent. One nervous disease appears often to be substituted for another, provided such diseases do not involve serious or destructive local lesions. But we are unable to see any real difference between the "constitutional neuropathy" of Griesinger, and the "hereditary disposition" of Anstie. But it is of more importance to recognize the justness and importance of the views of these authors than many will be apt to suppose. Hence we have given some space to a restatement of views which have long since ceased to be novel, and yet which have not attracted the attention they deserve. The clear admission of such views would have no small influence, to say the least, on prognosis and prophylaxis of neuralgias, and related affections. Among the predisposing causes of neuralgias, according to Dr. Eulenberg, are abnormalities in arterial tonus. We are inclined to lay more stress on this point than the author seems to do himself. But we have discussed this factor in the mechanism of neuralgias, already at length in the pages of the JOURNAL. He gives also an abstract of the views of Uspensky ("Versuch Einer Pathologie der Neuralgien." *Deutsches Archiv f. Clin. Med.*, xviii., Heft. I., 1876) on the pathology of neuralgia with which we can entirely agree. Uspensky seems to adopt almost the same notions on this subject which we have set forth at length, "Pathology and Treatment of Neuralgia," in this journal (vol. IV., p. 207) on a former occasion. According to Dr. Eulenberg certain cases of neuralgias may depend on a *neuritis migrans*, such as has been described by Feinberg and others as experimentally produced in the lower animals. But while such a causation of neuralgia is possible, it is not probable, especially when Feinberg's results are now disputed by recent observers. It is not

often one can find so full and suggestive a list of the causes of neuralgia. But we pass it by for the present.

Dr. Eulenberg enters upon a thorough discussion of the fallacies which are being daily committed in the diagnosis of neuralgias. Many affections are called neuralgic which have no real title to that name, and *vice versa.* The whole chapter on the diagnosis of neuralgias needs to be carefully read to be appreciated. No mere abstract would do it justice.

The same may be said of the section on Prognosis. It is almost a model discussion within moderate limits.

"The Therapeutics of Neuralgias," says the author, "has upon the whole the same difficulties to struggle with as the diagnosis and prognosis. We have before us a complex of symptoms, but in many cases we cannot at all, or only with difficulty, recognize the nature, anatomical seat and cause of the disease. Moreover, in many cases where the cause of the neuralgia is known, we are incapable of removing it. Finally, even after the removal of the cause, the resulting affection may remain as an independent disease, possibly through secondary alterations of the cell elements of the central organs, and we are limited to a purely symptomatic treatment, which, though it may lead to valuable palliative results, rarely accomplishes a permanent cure" (p. 61). But it will not be possible in this notice to follow Dr. Eulenberg in his judicious discussion of the general therapeutics of neuralgias. He adds nothing new to the means for combating them, but presents us with a well elaborated and penetrating review of existing knowledge on this difficult, and painfully practical theme.

He prefers, take it altogether, the faradic to the galvanic current, in the treatment of cutaneous neuralgias. Nussbaum's method of nerve-stretching, for the relief of obstinate neuralgias, is favorably mentioned. In his rather extended remarks on the conditions of anæsthesias and hypæsthesias, is a very suggestive discussion as to the trophic action of the nervous system, especially in relation to the skin. But this subject is examined by the author at greater length in his chapters on "Trophoneuroses," which it is our intention to notice in a subsequent number of the JOURNAL.